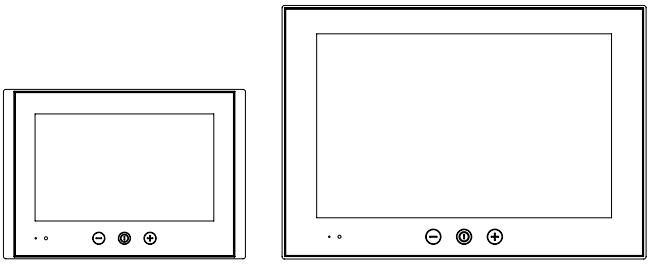
HATTELAND®
DISPLAY

USER MANUAL



Series X - Standard Display (STD) Models

HD 08T21 STD-xxx-Fxxx - 8.0 inch Standard Display
HD 13T21 STD-xxx-Fxxx - 13.3 inch Standard Display

User Manual STD Series X Compact	
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Please visit www.hatteland-display.com for the latest electronic version of this manual.

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WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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Contents of package

Item	Description	Illustration
HA-SDM-2M	1 pcs of Standard DVI Signal Cable. DVI-D 18+1P Male to DVI-D 18+1P Male Single Link - Length 2.0m	
DVI-4	1 pcs of DVI > RGB/VGA adapter DVI 12+5P Male to DSUB 15P Female	
MEDIA STD01	Documentation and Driver DVD/CD containing the user manual, including the Touch Screen driver for units delivered with a factory mounted touch screen.	Menu and Driver browser for Microsoft® Windows®
	Test Report	

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General

About this manual

The manual contains electrical, mechanical and input/output signal specifications. All specifications in this manual, due to manufacturing, new revisions and approvals, are subject to change without notice. However, the last update and revision of this manual are shown both on the frontpage and also in the “Revision History” chapter at the end of the manual.

Furthermore, for third party datasheet and user manuals, please see dedicated Documentation and Driver DVD delivered with the product or contact our sales/technical/helpdesk personnel for support.

About Hatteland Display

Hatteland Display is the leading technology provider of specialized display and computer products, delivering high quality, unique and customized solutions to the international maritime, naval and industrial markets.

The company represents innovation and quality to the system integrators world wide. Effective quality assurance and investment in sophisticated in-house manufacturing methods and facilities enable us to deliver Type Approved and Mil tested products. Our customer oriented approach, technical knowledge and dedication to R&D, makes us a trusted and preferred supplier of approved solutions, which are backed up by a strong service network.

www.hatteland-display.com

You will find our website full of useful information to help you make an informed choice as to the right product for your needs. You will find detailed product descriptions and specifications for the entire range on Displays, Computers and Panel Computers, Military solutions as well as the range of supporting accessories. The site carries a wealth of information regarding our product testing and approvals in addition to company contact information for our various offices around the world, the global service centers and the technical help desk, all ensuring the best possible support wherever you, or your vessel, may be in the world.

Contact Information

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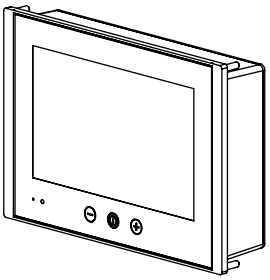
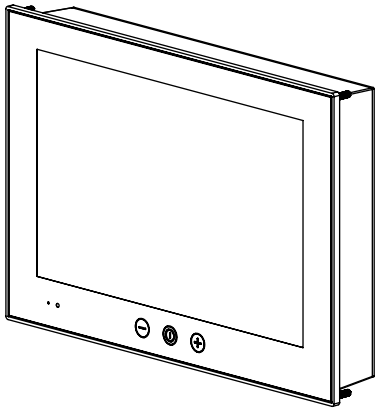
For an up-2-date list, please visit www.hatteland-display.com/locations

Standard Display (STD) - Introduction





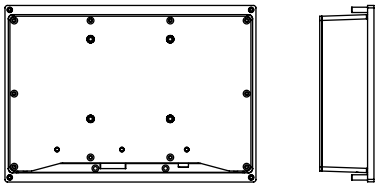
Series X Displays offer the ultimate in performance, convenience, state of the art design and enduring quality for system integrators and boat builders. Series X products offer a range of feature sets optimized for varying requirements and applications.

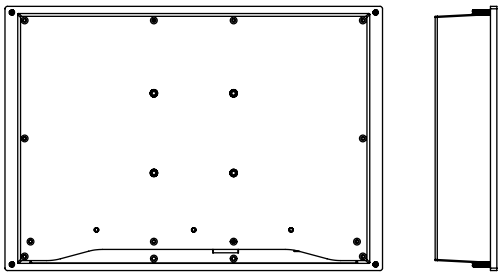
The Series X display range is a flexible monitor solution designed and type approved for the professional maritime segment, where reliability and long life time are key pre-requisites for the industry. The product range combines stunning design and technology with innovative features and options, making it all that the integrator needs for top class type-approved marine systems.

The entry level STD models provide a wide choice of display size and format for shipboard applications where simple data input (RGB & DVI) is required. Be it for ship navigation or automation, this range with all it's possible options provides a robust and cost effective platform from which to display and manage data. The models is delivered with a factory mounted Projected Capacitive Touch Screen (Multitouch, USB interface) as standard.

Series X displays feature HATTELAND® Glass Display Control™, LED backlight technology* and full dimming as standard, and can also accomodate and combine a number of options such as optical bonding and sunlight readability**

* 13 inch units has traditional CCFL backlight. From April 2012 LED backlight will be introduced.
** High Bright / Sunlight Readable models pending 2012.

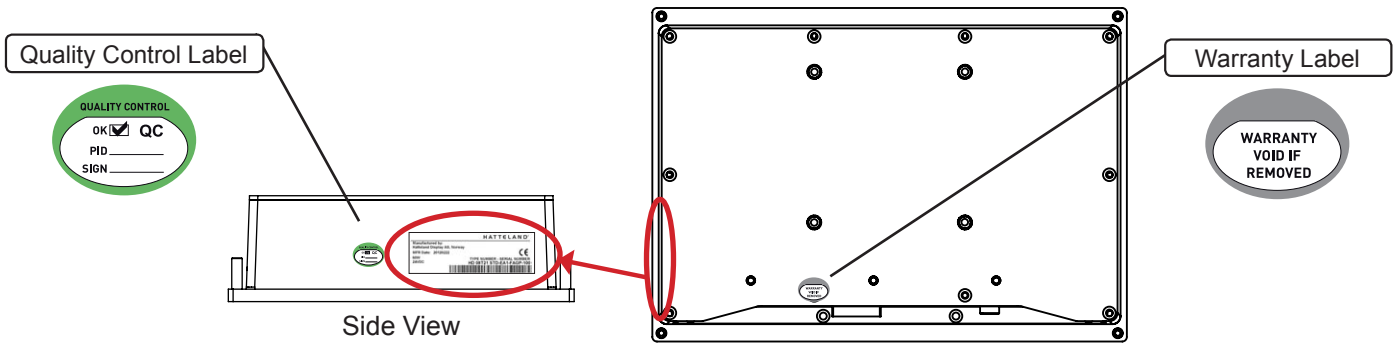




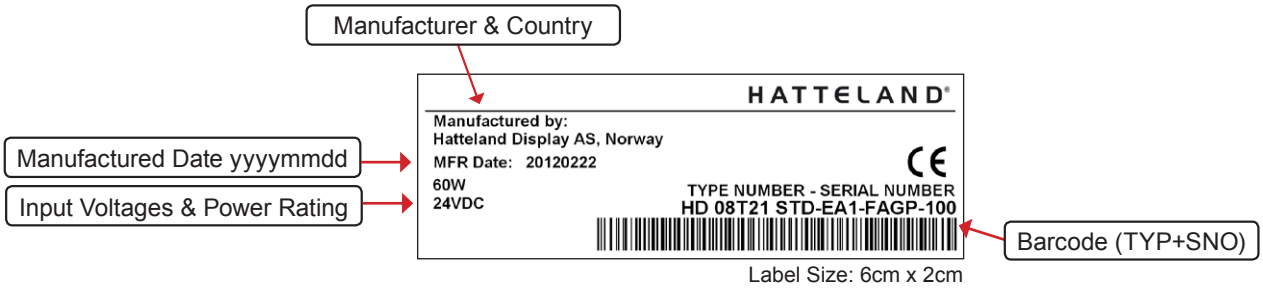
- MULTITOUCH
- Type Approved
- IP22 rear / IP66 front
- Superior Bonding Technology
- Module based, tailor-made systems made easy!
- Sunlight Readable / High Bright versions available
- GLASS DISPLAY CONTROL™ (GDC), Solid State Menu System

Product Labeling

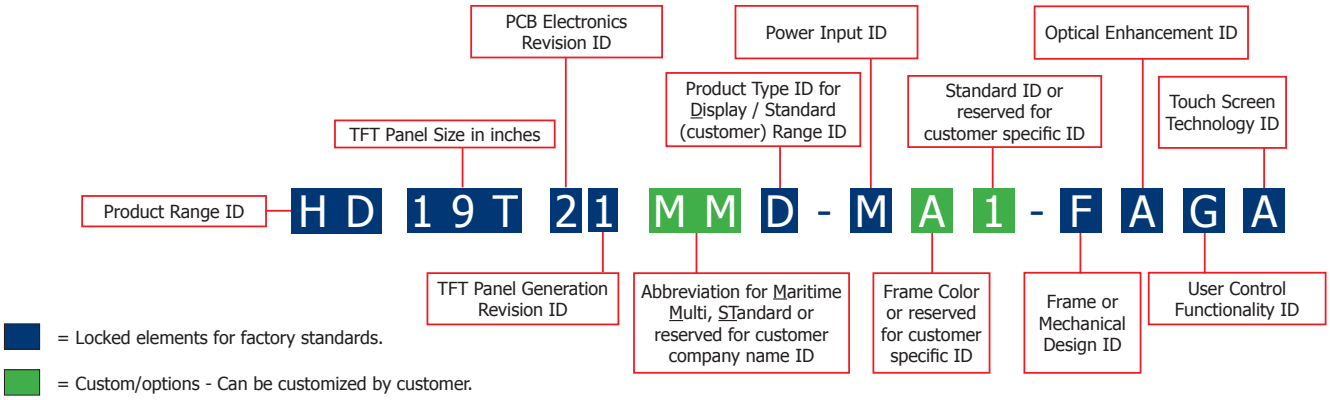
Labels and Locations



Serial Number Label Layout (example)



Typenumber Structure (example)


PCB Electronics Revision ID
Power Input ID
Optical Enhancement ID
Product Type ID for Display / Standard (customer) Range ID
Standard ID or reserved for customer specific ID
Touch Screen Technology ID
TFT Panel Size in inches
Product Range ID
HD 19T 21 MM D - M A 1 - F A G A
TFT Panel Generation Revision ID
Abbreviation for Maritime Multi, STandard or reserved for customer company name ID
Frame Color or reserved for customer specific ID
Frame or Mechanical Design ID
User Control Functionality ID
= Locked elements for factory standards.
= Custom/options - Can be customized by customer.

Warranty Label

If you are to perform service on a unit still under warranty, any warranty will be void if this label show signs of removal attempts (re-gluing) or removed completely. This label is located on the back of the product and covers a key screw. This is to aid service departments to determine if there has been any unauthorized service on a unit still under warranty.

Quality Control (QC) Label

This label indicates that the unit is produced, tested and packed according to manufacturer's QA specifications. It will include a Personal ID and signature by the personnell responsible for approving the unit in production, test and warehouse departments.

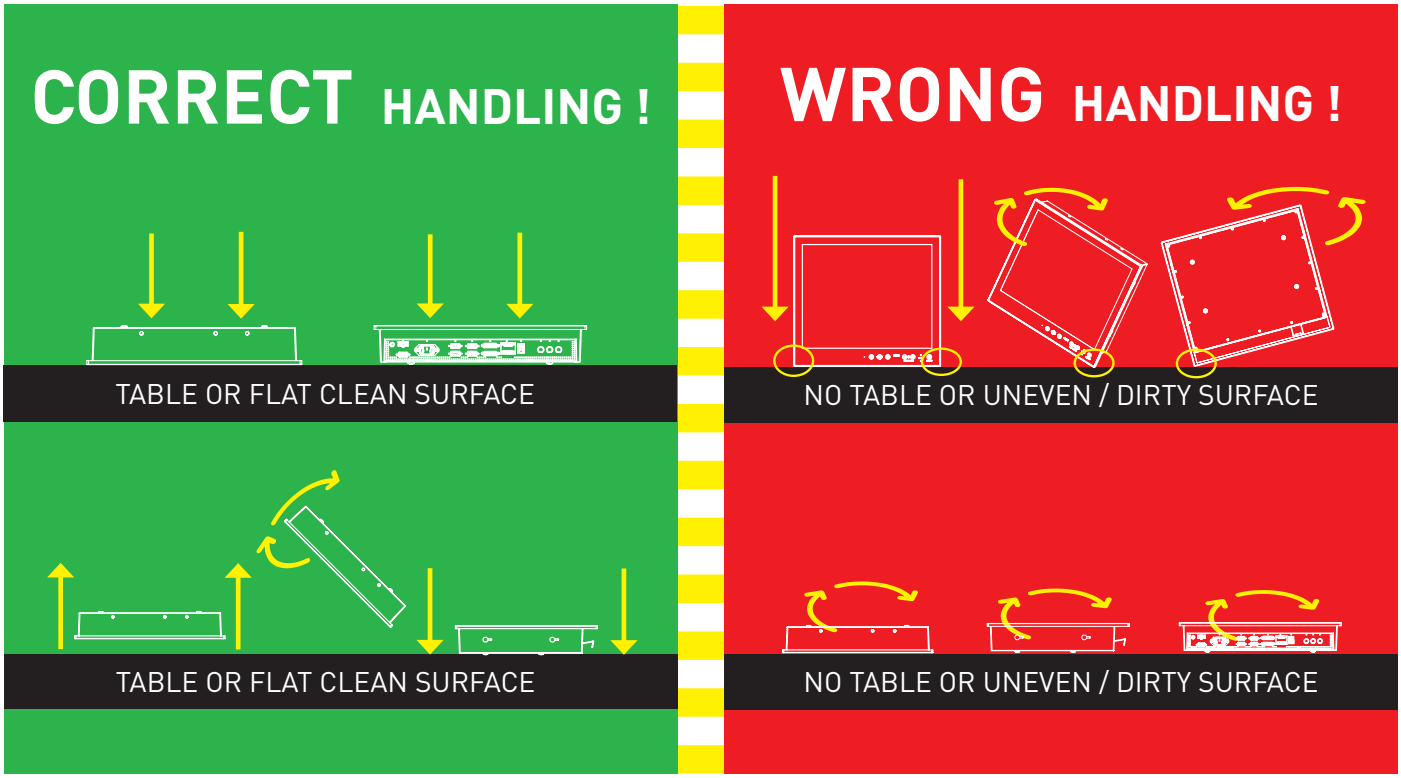
Installation

First Things First!

ATTENTION!

To prevent damage to chassis corners and / or breaking front glass, please review the illustrations below before handling the units!

IND100148-5 - Rev 01


CORRECT HANDLING !
WRONG HANDLING !
TABLE OR FLAT CLEAN SURFACE
NO TABLE OR UNEVEN / DIRTY SURFACE
TABLE OR FLAT CLEAN SURFACE
NO TABLE OR UNEVEN / DIRTY SURFACE

Installation and mounting

1. Most of our products are intended for various methods of installation or mounting (panel mounting, bracket mounting, ceiling/wall, console mounting etc.); for details, please see the relevant mechanical drawings.

2. Adequate ventilation is a necessary prerequisite for the life of the product. The air inlet and outlet openings must definitely be kept clear; coverings which restrict ventilation are not permissible.

3. Generally, do not install the unit in a horizontal position (laying down), as this will cause heat to build up inside the unit which will damage the LCD Panel. To prevent this problem we recommend installing the unit in a vertical position (±30 degrees) to improve the airflow through the unit.

4. To further improve the cooling of the unit we recommend installing Cooling Fans underneath blowing upwards into the unit air inlet. This may be required in high temperature applications and also when there is reason to expect temperature problems due to non-optimal way of mounting.

5. Exposure to extreme direct sunlight can cause a considerable increase in the temperature of the unit, and might under certain circumstances lead to overtemperature. This point should already be taken into consideration when the bridge equipment is being planned (sun shades, distance from the windows, ventilation, etc.)

6. Space necessary for ventilation, for cable inlets, for the operating procedures and for maintenance, must be provided.

7. If the push buttons of the product are not illuminated, an external, dimmable illumination (IEC 60945 Ed. 4, 4.2.2.3, e.g. Goose neck light) is required for navigational use. The illumination shall be dazzle-free and adjustable to extinction.

8. Information about necessary pull-relievers for cables is indicated in the Physical Connection section of this manual. Attention must be paid to this information so that cable breaks will not occur, e.g. during service work.

9. Do not paint the product. The surface treatment influences on the excess heat transfer. Painting, labels or other surface treatments that differ from the factory default, might cause overheating.

10. Expose to heavy vibration and acoustic noise might under certain circumstances affect functionality and expected lifetime. This must be considered during system assembly and installation. Mounting position must carefully be selected to avoid any exposure of amplified vibration.

General mounting instructions

1. The useful life of the components of all Electronics Units generally decreases with increasing ambient temperature; it is therefore advisable to install such units in air-conditioned rooms. If there are no such facilities these rooms must at least be dry, adequately ventilated and kept at a suitable temperature in order to prevent the formation of condensation inside the display unit.

2. With most Electronic Units, cooling takes place via the surface of the casing. The cooling must not be impaired by partial covering of the unit or by installation of the unit in a confined cabinet.

3. In the area of the wheel house, the distance of each electronics unit from the magnetic standard compass or the magnetic steering compass must not be less than the permitted magnetic protection distance. This distance is measured from the centre of the magnetic system of the compass to the nearest point on the corresponding unit concerned.

4. Units which are to be used on the bridge wing must be installed inside the “wing control console” protected against the weather. In order to avoid misting of the viewing screen, a 25 ... 50 W console-heating (power depending on the volume) is recommended.
5. When selecting the site of a display unit, the maximum cable lengths have to be considered.

6. When a product is being installed, the surface base or bulkhead must be checked to ensure that it is flat in order to avoid twisting of the unit when the fixing screws are tightened, because such twisting would impair mechanical functions. Any unevenness should be compensated for by means of spacing-washers.

7. The grounding screws of the units must be connected to the body of the ship (ground); the wire used should have a cross sectional area of at least 6 mm^2.

8. Transportation damage, even if apparently insignificant at first glance, must immediately be examined and be reported to the freight carrier. The moment of setting-to-work of the equipment is too late, not only for reporting the damage but also for the supply of replacements.

9. The classification is only valid for approved mounting brackets provided by Hatteland Display. The unit shall be mounted stand-alone without any devices or loose parts placed at or nearby the unit. Any other type of mounting might require test and re-classification.

General Installation Recommendations

Ergonomics

1. Adjust the unit height so that the top of the screen is at or below eye level. Your eyes should look slightly downwards when viewing the middle of the screen.

2. Adjust screen inclination to remain gaze angle to the centre of the screen approximately perpendicular to the line of gaze.

3. When products are to be operated both from a sitting position and from a standing position, a screen inclination of about 30° to 40° (from a vertical plane) has turned out to be favourable.

4. The brightness of displays is limited. Sunlight passing directly through the bridge windows - or its reflection - which falls upon the screen workplaces must be reduced by suitable means (negatively inclined window surfaces, venetian blinds, distance from the windows, dark colouring of the deckhead). However, units can be offered with optical enhanced technology to reduce reflections and are viewable in direct sun light, but as a general rule the units at the bridge wing area is recommended to be installed or mounted by suitable alignment or bulkhead / deckhead mounting in such a way that reflections of light from the front pane of the display are not directed into the observer's viewing direction.

5. The use of ordinary commercial filter plates or filter films is not permitted for items of equipment that require approval (by optical effects, "aids" of that kind can suppress small radar targets, for example).

6. For ECDIS applications, the minimum recommended viewing distance are as follows:
   (IEC62288, Part 7.5 Screen resolution)

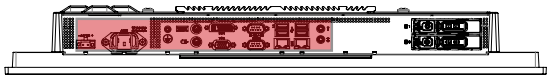
17 inch = 908mm	19 inch = 1011mm	20 inch = 878mm	23 inch = 1011mm	27 inch = 1000mm	

Cables

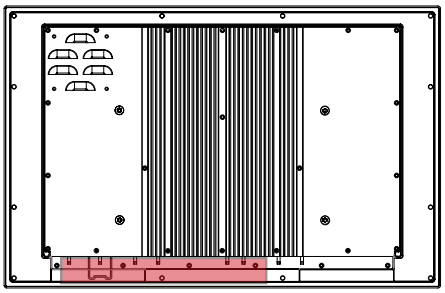
Use only high quality shielded signal cables.

Cable Entries & Connectors (Marked area) - Illustration only

Bottom View



Back View



Maximum Cable Length

Any cable should generally be kept as short as possible to provide a high quality input/output. The maximum signal cable length will depend on the signal resolution and frequency, but also on the quality of the signal output from the computer/radar.

Configuring housing connectors

Housing connectors are available in different sizes (2-pin, 4-pin, 5-pin) which plugs into the connector area of the unit. These housing connectors are by factory default mounted on the unit. Below is a brief illustration that might be useful during configuration and installation of such connectors. You will need suitable pre-configured cable(s) and tools to configure the connector(s) and cable(s) that are present in your installation environment. Below is a sample for a 2-pin DC power connector. The procedure is the same for other connectors of this type.

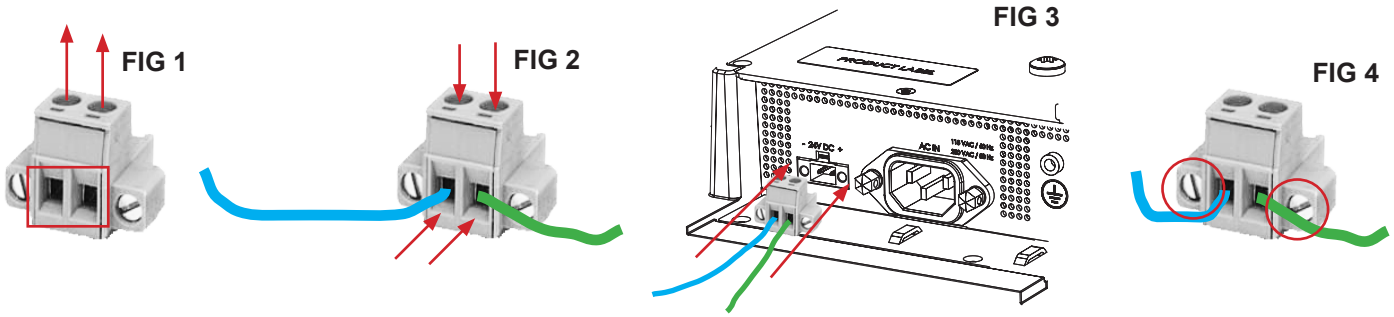


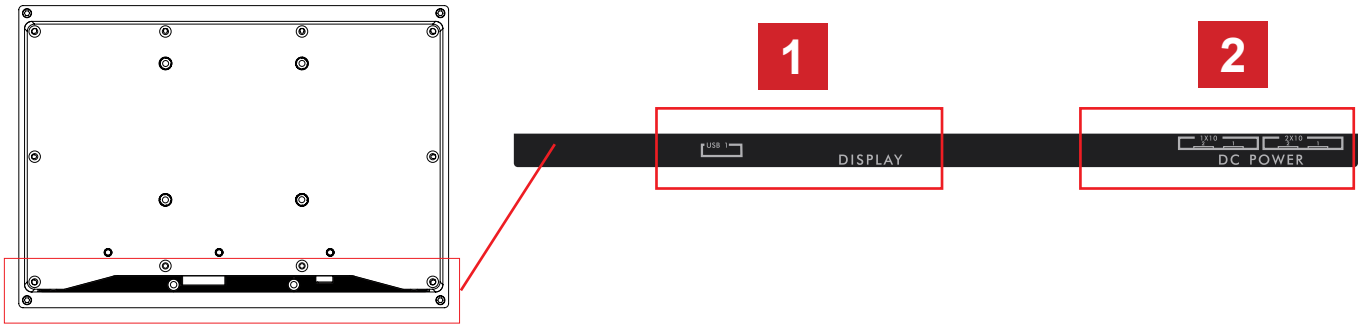
FIG 1: Unscrew (from top) or make sure that the screw terminal (square area) are fully open, so you can secure the inserted cables correctly to the loose housing connector (it may already be plugged into the unit as per factory installation).

FIG 2: Insert cables* (from front) and screw / secure the cables by turning the screw on top of the housing to secure the cables properly. Check that the cables is firmly in place and do not appear loose or falls out when pulling gently.

**Note: Required polarization verification (for instance -/+ for DC power input) should conform with the markings on the connector area of the unit. Ignoring the markings on the unit or its add-on modules might damage the unit and/or external equipment in which end, warranty will be void.*

FIG 3: Plug the housing into the appropriate connector area of the unit and check again that the cables secured conforms with the markings on the connector area of the unit. Finalize the installation by fasten the screws located in front on each side of the housing connector **(FIG 4).**

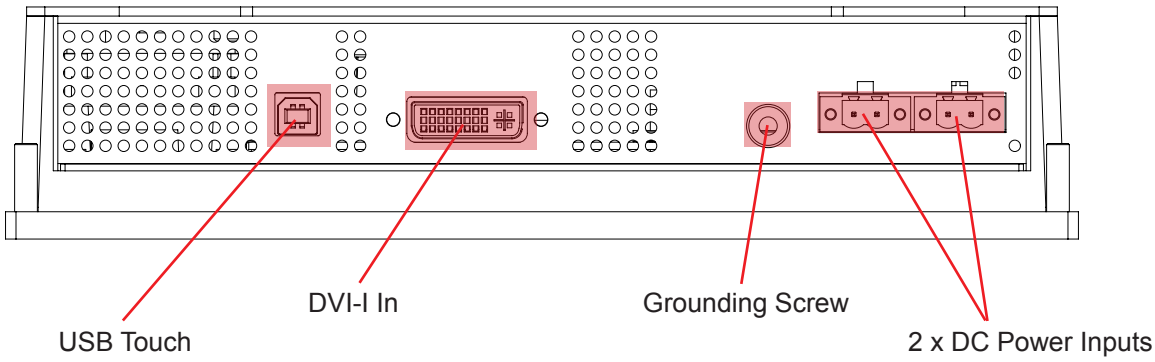
Terminal Label Markings of 8 inch unit



1 USB 1 DISPLAY

2 1X10 2X10 DC POWER

Connection area of 8 inch unit



Terminal Label Markings of 13 inch unit

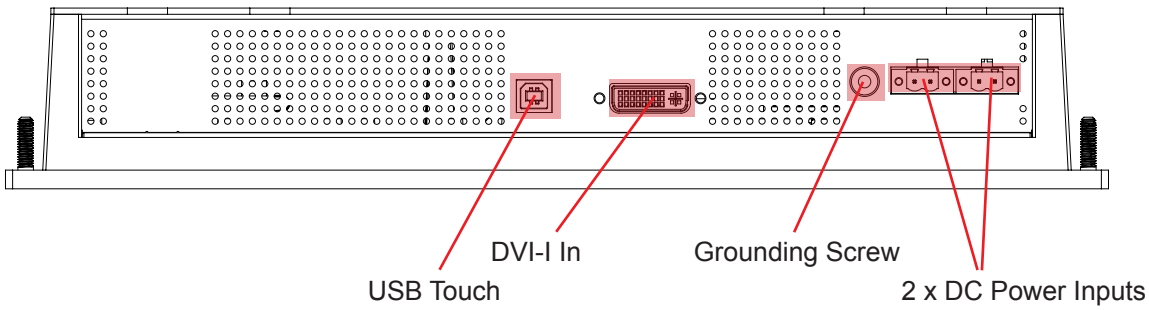
1

DISPLAY

2

DC POWER

Connection area of 13 inch unit

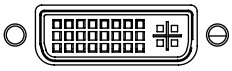


Physical Connections

Note: For details about the connectors below,
please review the “Pinout Assignments” section in this manual.

USB TOUCH:

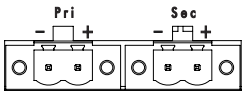
Connect a TYPE B USB Cable between this connector and your PC. Suitable drivers to install and calibrate the touchscreen are available on the separate installation media delivered with the unit. USB1.1 is suitable for cable distances above 10meter/32.8 feet, whereas USB2.0 is suitable from less than 10meter/32.8 feet distances.



DVI-I IN:

Connect your DVI cable to the DVI-I 29P Connector (female). The DVI-I connector can function as regular RGB IN by using a DVI-I > RGB/VGA adapter. Secure the DVI cable to the hex spacers provided on the unit and make sure you do not bend any of the pins inside the connector. Connect the other end of the cable to the DVI connector on your equipment and secure it.

Important note for DVI signal detection:
Please note that for the operating system to detect DVI signals correctly, the DVI cable MUST be connected physically to the unit during boot up otherwise you may experience a black image. Furthermore certain graphics drivers may need to refresh their device list (often done manually by user - detect devices), while in some cases the Plug-n-Play will automatically detect the DVI signal correctly. Please consult your local technician if you have this behaviour of detection problems when using DVI. In all cases the problem can be solved in the operating system, and this is not a malfunction in the graphic controller for display units.



POWER INPUTS:

Connect your DC power cables to the SL-SMT 90F connector block. The internal DC power module supports 24VDC. The unit offer both Primary and Secondary power inputs for secure operation of the unit as well as; galvanic isolated and automatic switch between power source.

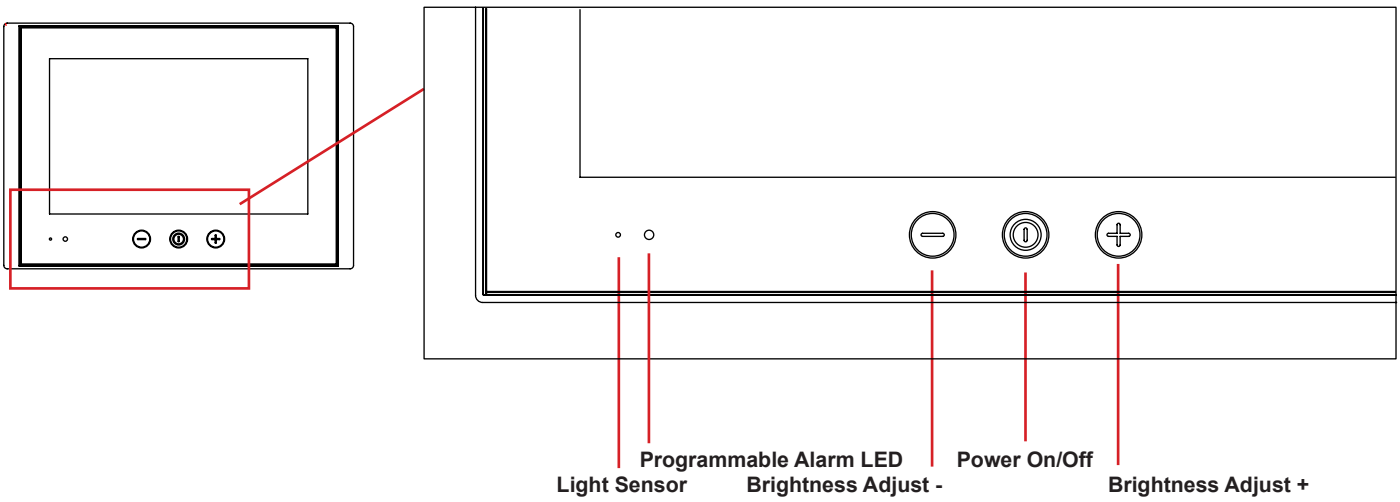
GROUNDING SCREW:

Note: DC models are required / recommended to be properly grounded via the ⏚ screw located on the unit. Please review “General Installation Chapter”, pt. 6 for more information.

Operation

USER CONTROLS OVERVIEW

The units are designed by using HATTELAND® Glass Display Control™ (GDC) touch technology to allow interactivity adjusting brilliance (brightness) and control power on / off with the use of illuminated symbols. Note that these symbols are only visible (backlight illuminated) when suitable power is connected. There is no physical moving knobs, potmeters, wheels or push buttons available as everything is touch surface controlled by Projected Capacitive technology, that allows a human finger (including several types of gloves) to control the unit.



Light Sensor:

Used to sense level of ambient light in the surrounding environment. The sensor data can be read by suitable software through the Hatteland Display SCOM functionality of the unit and thus can be used to control brightness remotely. Note: This sensor is not visible for the eye or has any illumination behind to indicate it's position. Further, by touching or covering this area will naturally make the sensor data inaccurate.

Programmable Alarm LED:

Used to indicate an Alarm or similar functionality. The logic to this LED can be programmed through customized API which gives access to controlling its function and for instance setup blinking patterns. Note: This LED (when not activated) is not visible for the eye or has any illumination behind to indicate it's position. Further, by touching this area no action will be performed or has been assigned.

Brightness Adjust:

Brilliance / Brightness adjustment of the displayed image is adjusted by touching the (-) or (+) illuminated symbols. Both symbols are visible as long as the unit is powered.

Power ON/OFF:

Touching this symbol will either turn on or off the unit.

Specifications

Specifications - HD 08T21 STD-xxx-Fxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- 8.0 inch TFT Liquid Crystal Display module
- Widescreen, Aspect Ratio 5:3
- LED Backlight
- TTL Interface
- a-si TFT Active Matrix

TFT Characteristics:

- Native Resolution : 800 x 480 (WVGA)
- Pixel Pitch (RGB) : 0.2168 (H) x 0.2168 (V) mm
- Response Time : 5/11ms (typical) (Tr/Tf)
- Contrast Ratio : 600:1 (typical)
- Light Intensity : 600 cd/m^2 (typical)
- Viewable Angle : 70 deg (H) 60 deg (V) (typical)
- Active Display Area : 173.4 (H) x 104.4 (V) mm
- Max Colors : 16.7 million

Synchronization:

- Digital separate synchronization
- Composite synchronization
- Synchronization on green
- Auto detects on chosen source
- Video Signal : Analog RGB 0,7Vp-p
  : Input Impedance 75 Ohm

Synchronization Range:

- Horizontal : 24 kHz to 81 kHz
- Vertical : 50 Hz to 75 Hz*

** 60Hz is recommended for optimal picture quality*

Supported Signals:

Resolutions:

- WVGA : 640 x 480, 720 x 400, 800 x 480*

** Recommended for optimal picture quality*

Power Specifications:

Power Supply:

- 2 x 24VDC : Model HD 08T21 STD-Exx-Fxxx
  Dual input, galvanic isolated, automatic switch between power source

Power Consumption:

- Operating : 20W (typ) - 30W (max)

Physical Considerations:

- 236.00 (W) x 166.00 (H) x 51.00 (D) mm
- 9.29" (W) x 6.54" (H) x 2.01" (D)
- 4 x M4 VESA mounting 75x75mm, Max 8mm deep
- Built-in Console mounting 4 x M5x15mm screws
- Weight: TBD kg (approx)

Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female or RGB IN with adapter
- Touchscreen : 1 x USB TYPE B Connector (female)
- DC Power IN : 2 x SL-SMT 90F (1 x 2 pole)

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Light Sensor (not visible),
- Programmable Alarm LED, Buzzer (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front - IP22 rear (EN60529)

Safety Considerations:

Even although the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

Factory Mounted Options:

- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*

Available Accessories:

- TBD

* Release date to be confirmed. Please contact us for more information.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdflink/ind100780-3.php

Available Standard Models:

- HD 08T21 STD-EA1-FAGP = Dual DC, GDC, Buzzer, PCTouch
- HD 08T21 STD-EA1-FOGP = Dual DC, Optical Bonding Technology, GDC, Buzzer, PCTouch

Compass Safe Distance: HD 08T21 STD-xxx-Fxxx Standard: 45cm Steering: 25cm
MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25ºC) = TBD hours

TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

IEC 60945 4th (EN 60945:2002) (pending)
GL - Germanischer Lloyd (pending)
BV - Bureau Veritas (pending)
IACS E10 (pending)
DNV - Det Norske Veritas (pending)
LRS - Loyd's Register of Shipping (pending)
ClassNK - Nippon Kaiji Kyokai (pending)
ABS - American Bureau of Shipping (pending)

Specifications - HD 13T21 STD-xxx-Fxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- 13.3 inch TFT Liquid Crystal Display module
- Widescreen, Aspect Ratio 16:10
- a-si TFT Active Matrix
- CCFL Backlight

TFT Characteristics:

- Native Resolution : 1280 x 800 (WXGA)
- Pixel Pitch (RGB) : 0.2235 (H) x 0.2235 (V) mm
- Response Time : 6/10ms (typical) (Tr/Tf)
- Contrast Ratio : 800:1 (typical)
- Light Intensity : 400 cd/m2 (typical)
- Viewable Angle : 70 deg (H) 60 deg (V) (typical)
- Active Display Area : 286.08 (H) x 178.8 (V) mm
- Max Colors : 16.7 million

Synchronization:

- Digital separate synchronization
- Composite synchronization
- Synchronization on green
- Auto detects on chosen source
- Video Signal : Analog RGB 0,7Vp-p
  : Input Impedance 75 Ohm

Synchronization Range:

- Horizontal : 24 kHz to 81 kHz
- Vertical : 50 Hz to 75 Hz*

** 60Hz is recommended for optimal picture quality*

Supported Signals:

Resolutions:

- WVGA : 640 x 480 (including 720 x 400)
- WSVGA : 800 x 600
- WXGA : 1024 x 768, 1280 x 800*

** Recommended for optimal picture quality*

Power Specifications:

Power Supply:

- 2 x 24VDC : Model HD 13T21 STD-Exx-Fxxx
  Dual input, galvanic isolated, automatic switch between power source

Power Consumption:

- Operating : 20W (typ) - 30W (max)

Physical Considerations:

- 355.00 (W) x 248.50 (H) x 58.00 (D) mm
- 13.98" (W) x 9.78" (H) x 2.28" (D)
- Compatible VESA mounting 75mm, 4xM4 VESA mounting, Max 8mm deep
- Built-in Console mounting 4 x M5x15mm screws
- Weight: TBD kg (approx)

Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as RGB IN with adapter)
- Touchscreen : 1 x USB TYPE B Connector (female)
- DC Power IN : 2 x SL-SMT 90F (1 x 2 pole)

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Light Sensor (not visible)
- Programmable Alarm LED, Buzzer (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front - IP22 rear (EN60529)

Safety Considerations:

Even although the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

Factory Mounted Options:

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Available Accessories:

- TBD

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Available Standard Models:

- HD 13T21 STD-EA1-FAGP = Dual DC, GDC, Buzzer, PCTouch
- HD 13T21 STD-EA1-FOGP = Dual DC, Optical Bonding Technology, GDC, Buzzer, PCTouch

Compass Safe Distance: HD 13T21 STD-xxx-Fxxx Standard: 80cm Steering: 45cm
MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25ºC) = TBD hours

TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

IEC 60945 4th (EN 60945:2002) (pending)
GL - Germanischer Lloyd (pending)
BV - Bureau Veritas (pending)
IACS E10 (pending)
DNV - Det Norske Veritas (pending)
LRS - Loyd's Register of Shipping (pending)
ClassNK - Nippon Kaiji Kyokai (pending)
ABS - American Bureau of Shipping (pending)

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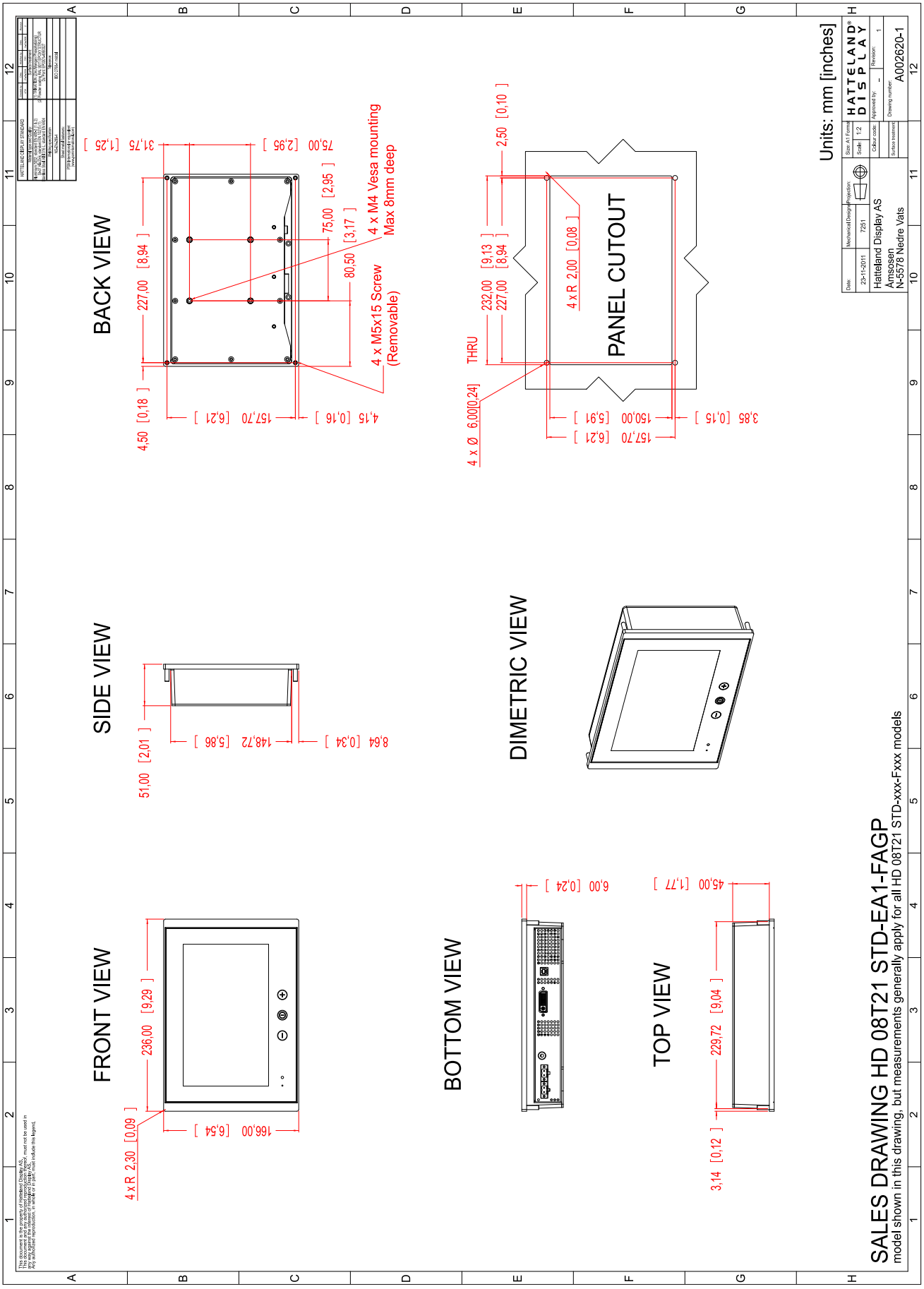
Technical Drawings

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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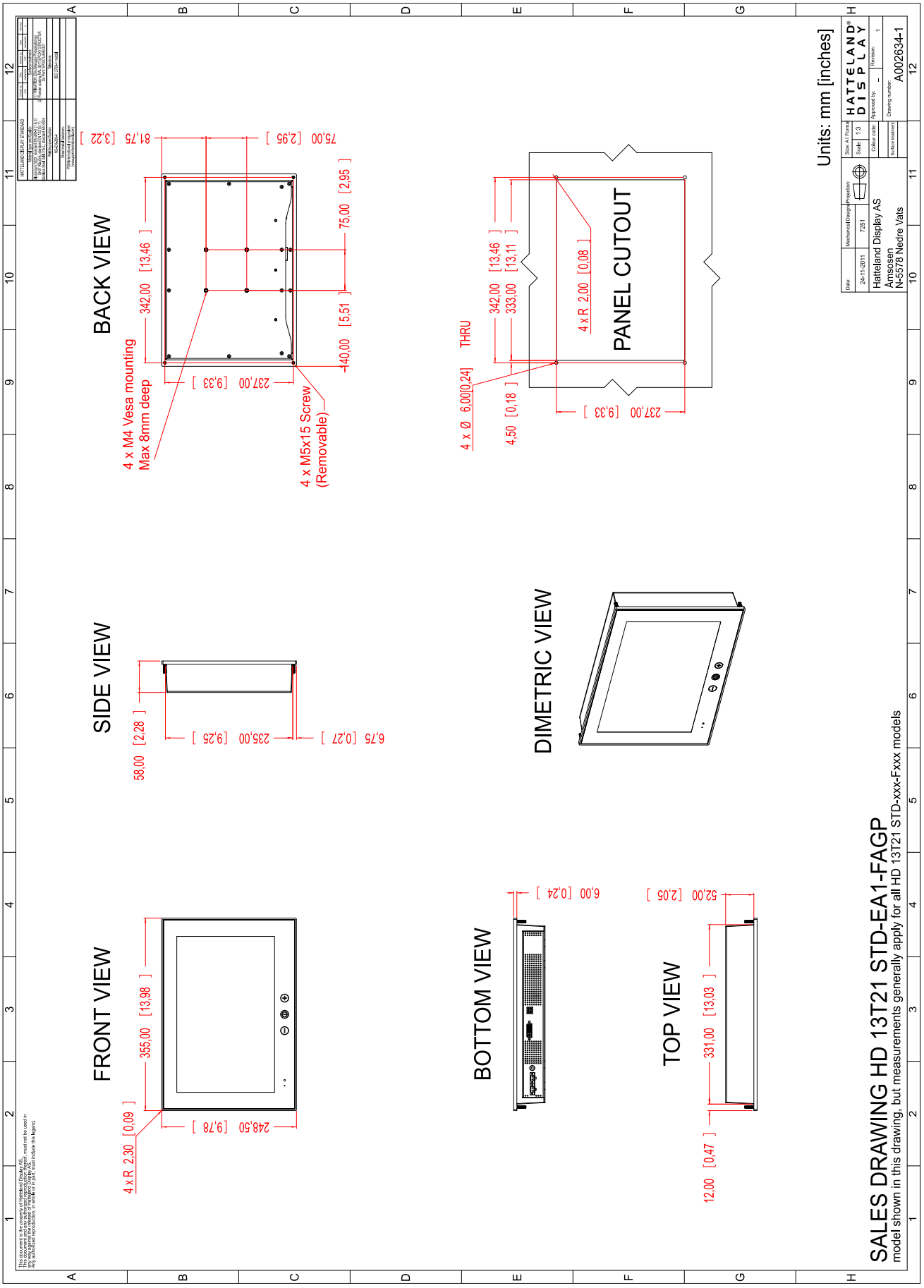

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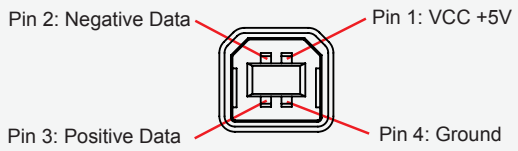
Appendixes

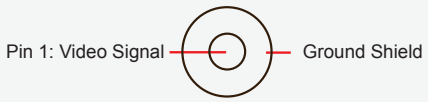
Pinout Assignments

All pin out assignments are seen from users Point of View (POV) while looking straight at the connector.

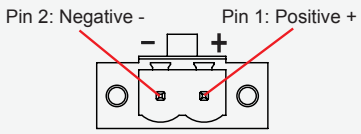
4 pin USB TYPE B



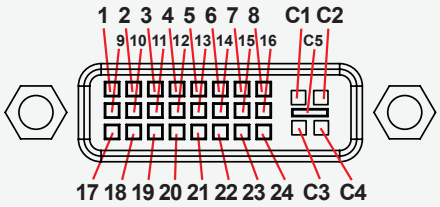
1 pin RCA/BNC COMP. VIDEO



2 pin DC Power Input, Phoenix



18/24/24+5 pin DVI-D, DVI-I, Single Link, Dual Link Combined



PIN 01	T.M.D.S. Data2 - (Digital - RED link 1)
PIN 02	T.M.D.S. Data2 + (Digital + RED link 1)
PIN 03	T.M.D.S. Data2/4 Shield
PIN 04	T.M.D.S. Data4 - (Digital - GREEN link 2)
PIN 05	T.M.D.S. Data4 + (Digital + GREEN link 2)
PIN 06	DDC Clock
PIN 07	DDC Data
PIN 08	Analog Vertical Sync (DVI-I only)
PIN 09	T.M.D.S. Data1 - (Digital - GREEN link 1)
PIN 10	T.M.D.S. Data1 + (Digital + GREEN link 1)
PIN 11	T.M.D.S. Data1/3 Shield
PIN 12	T.M.D.S. Data3 - (Digital - BLUE link 2)
PIN 13	T.M.D.S. Data3 + (Digital + BLUE link 2)
PIN 14	+5V Power (for standby mode)
PIN 15	Ground (for +5V and analog sync)
PIN 16	Hot Plug Detect
PIN 17	T.M.D.S. Data0 - (Digital - BLUE link 1) and digital sync.
PIN 18	T.M.D.S. Data0 + (Digital + BLUE link 1) and digital sync.
PIN 19	T.M.D.S. Data0/5 Shield
PIN 20	T.M.D.S. Data5 - (Digital - RED link 2)
PIN 21	T.M.D.S. Data5 + (Digital - RED link 2)
PIN 22	T.M.D.S. Clock Shield
PIN 23	T.M.D.S. Clock + (Digital clock + (Links 1 and 2)
PIN 24	T.M.D.S. Clock - (Digital clock - (Links 1 and 2)
PIN C1	Analog RED
PIN C2	Analog GREEN
PIN C3	Analog BLUE
PIN C4	Analog Horizontal Sync.
PIN C5	Analog Ground (return for RGB signals)

DDC = Display Data Channel.
.M.D.S = Transition Minimized Differential Signal
PIN C1,C2,C3,C4 = Only present on DVI-I connectors.

NOTE: Connector shows a DUAL LINK design, but some units may not support it. Only units with 1920x1200 or more in resolution require / support DUAL LINK.

Basic Trouble-shooting

GENERAL ISSUES FOR TFT PANEL BASED PRODUCTS

Note: Applies for a range of various products. This is only meant as a general guide.

NO PICTURE / LED BEHAVIOUR:
If there is no light at all in the LED at the FRONT, check power cables. If the LED in front is green then check if the brightness is set/adjusted to max brightness. Lack of image is most likely to be caused by incorrect connection, lack of power or wrong BIOS settings.

SCROLLING / UNSTABLE IMAGE:
Signal cable may not be completely connected to computer or TFT display. Check the pin assignments and signal timings of the display and your video card with respect to recommended timing and pin assignments. Make sure that the video card is compatible and that it is properly seated / installed on the computer.

DISPLAY AREA IS NOT CENTERED / SIZED CORRECTLY
Make sure that a supported video mode has been selected on the display, or on the video card / system. If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test it again using another graphics card for the PC system. This situation may occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal, such as a signal splitter (please note that normally a signal splitter will not have any adverse effect). If it is impossible to change to the correct resolution/color depth, check if you have the right graphics driver installed in your system.

IMAGE APPEARANCE:
A faulty TFT panel can have black lines, pixel errors, failed sections, flickering or flashing image. Incorrect graphic card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, it may scroll, flicker badly or possibly even no image is present. Sparkling on the display may be a faulty TFT panel signal cable, and it needs service attention.

RGB Signal Only: Horizontal interference can usually be corrected by adjusting the PHASE (OSD menu).
Vertical interference can usually be corrected by adjusting the FREQUENCY (OSD menu).

DEW CONDENSATION BEHIND GLASS:
Note that this problem will not occur on bonded products. For non-bonded products, do the following:
Power on the TFT product and set brightness to 100%. Turn off any automatic screensavers on PC or similar. During minutes the dew will be gone. To speed up the process, use a fan heater for a reasonable time. Do not overheat the unit.

GENERAL ISSUES FOR COMPUTER BASED PRODUCTS

Note: Applies for a range of various products. This is only meant as a general guide.

CD-ROM FAILURE OR READ/DETECTION PROBLEMS:
If the product are operated/located in a area with extreme condensation, the CD/DVD drive may not work correctly due to condensation on the read head. Keep the product on for a while until it's reached normal operating temperature, and retry accessing discs. Otherwise, consider using USB memory sticks or alternative storage devices.

NO CD-ROM AVAILABLE ON YOUR PRODUCT FOR INSTALLING DRIVERS/SOFTWARE:
Please use USB memory sticks, USB Floppy drive, USB CD-Rom Drive or alternative storage devices to transfer/install software on CD-ROM-less units.

HATTELAND®
DISPLAY

Declaration of Conformity

We, manufacturer, **Hatteland Display AS**
Åmsosen, N-5578 Nedre Vats, Norway

declare under our sole responsibility that the
JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD, HT STD, HD MMD, HM MMD, HT MMC and HD MMC product ranges is in conformity with the following standards in accordance with the EMC Directive.

Low Voltage Directive 2006/95/EC
EN 60950

EMC Directive 2004/108/EC
EN 55022 Class A
EN 55024

Signature:.....
Frode Grindheim
Vice President Product Management
Nedre Vats, Norway

Signature:.....
Arne Kristiansen
Site Manager - Test & Commission Division
Oslo, Norway

CE

CE MARK FIRST AFFIXED DATE (11 March 2010)

HATTELAND®
DISPLAY

Declaration of Conformity

We, manufacturer, **Hatteland Display AS**
Åmsosen, N-5578 Nedre Vats, Norway

declare under our sole responsibility that the products listed below comply with
FCC 47 CFR Part 15, Subpart B, Class A:

JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD,
HT STD, HD MMD, HM MMD, HT MMC and HD MMC product ranges.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Signature:.....
Frode Grindheim
Vice President Product Management
Nedre Vats, Norway

Signature:.....
Arne Kristiansen
Site Manager - Test & Commission Division
Oslo, Norway

FCC

FCC MARK FIRST AFFIXED DATE (16 February 2012)

Return Of Goods Information

Return of goods:

(Applies not to warranty/normal service/repair of products)

Hatteland Display referenced as “manufacturer” in this document.

Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaulation or products subject for credit, you must ensure that all accessories received from our warehouse is returned. This applies to cables, powermodules and additional equipment except screws or similar, user manual, datasheets or other written paper documents. Furthermore, the product must not have any minor / medium or severe scratches, chemical spills or similar on the backcover, front frame or glass.

This is needed to credit the invoice 100%. Missing parts will not be subject for credit, and you will not get total credit for returned product. You will either be charged separately or the amount is withdrawn from the credit. If you decide to ship the missing items on the after hand, you will get 100% credit for that particular invoice or items received at manufacturer incoming goods control. Please contact our service/sales department if additional questions

Handling and packing units for return/credit

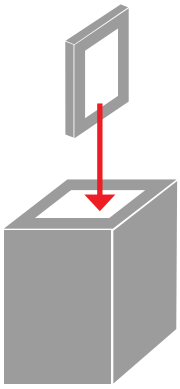
To prevent damage during shipping and transportation, respect the guidelines below.

Make sure you surround the product with the following material (whenever possible):

Use the original packaging from manufacturer, firm foam material, bubble wrap, lots of PadPack paper or foam chips/polyester wrapped in sealed plastic bags. Please make sure that the unit is protected with a surrounding plastic bag to prevent dust accumulation around the unit.

If you do not have the original packaging or are uncertain how to secure the unit properly, please consider seeking advice from nearby shipping or transportation offices, if in doubt!

Do not under any circumstances use loose foam chips, expanded polyester, clothes, cardboard with sharp edges/spikes, too little or nothing to secure the unit inside the box. Do not use cardboard boxes that are clearly too weak or not suitable for securing the unit properly during overseas shipment.



Terms Of Sale And Delivery

1) APPLICATION
The terms of sale and delivery apply for Hatteland Display.

2) PRICE

a) The price is per each, if nothing else has been stated, VAT not included. Price is based on the prices from our suppliers, current custom rates, taxes, rate of exchange and international raw material prices. We reserve ourselves the rights to adjustments in case of alternation on the above mentioned.

b) Included in the price is the supplier's standard packing. In case of re-packing/smaller quantities we reserve ourselves the right to add an additional sum for warrantable packing according to CECC 0015 (Basic inspection for protection of electrostatic sensitive devices)

3) VALIDITY
If nothing else has been stated in our quotation, the offer is valid for 30 days from the date of quotation.

4) PACKAGE QUOTATION
A package quotation means that all the components offered, must be ordered by us. If one component or more are removed from the quotation, the prices given in the package quotation are not valid.

5) TERMS OF PAYMENT
Cash on delivery or payment in advance. Net granted for companies, schools and institutions only, according to agreement. In case of too late payment 1.5% interest/month will be charged. Seller has mortage rights in the goods delivered until the purchase price, additional interests and charges have been paid in full. Accepted bill is not considered as payment until it has been honoured in full.

6) TIME OF DELIVERY
The quoted time of delivery is based on information from our suppliers. We disclaim any responsibility for the consequences of any delay or cancellation from our suppliers. Belated delivery gives not solely the right for cancellation.

7) DELIVERY POINT OF TIME
Goods are considered delivered to customer when handed over to charterer.

8) FREIGHT / PACKING / FORWARDING FEE
Hatteland Display AS charge NOK 50,- in forwarding fee for orders below NOK 1000,-.
Freight charge according to expenses for orders above NOK 1000,-. VAT not included.

9) COMPLAINT
By receipt customer must check goods for obvious defects which have to be claimed within 8 days from receipt. Otherwise acceptance of complaint can not be counted on.

10) GUARANTEE / SERVICES
Time of guarantee is calculated from our date of shipment, and applies to the extent that we are covered by our supplier's guarantee regulations. The guarantee does no longer apply if:

I) there has been encroached upon the goods without seller's consent
II) terms of payment is not fulfilled
III) the goods have been damaged due to unskilled treatment
IV) components which are sensitive for static electricity have not been unpacked and treated in a secure way.

Minimum requirements: CECC 00015's standards for handling of such components. The guarantee does not include fair wear and tear.

11) RESPONSIBLITY
Seller undertake to deliver faultless and functional capable goods according to existing technical specifications. Seller disclaim responsibility for any damage or loss which directly or indirectly may be caused due to failure or defect with the delivered goods, if carelessness from the seller can be limited up to the cost of the goods. The supplier's responsibility for defects with the supplied goods do not include secondary damage or loss.

12) CANCELLATION / RETURN
Binding sales contract is concluded when we have confirmed customer's purchase order. Any disagreements in our order confirmation must be reported to seller within 6 days. The agreement can not be altered without our permission, after acceptance from our supplier. If goods are wanted to be returned, a Return No must be assigned from seller. Returned goods without a Return No will not be accepted. By return of stock listed goods, 20% return fee is charged. Returned goods are shipped on customer's account and risk.

13) LOAN, RENT and DEMO
When borrowing of goods for demo/test, the date of return must be added to the document. If no date has been stated, date of return is two weeks from the date of the document. Before return, seller must be contacted for a Return No (RTK). Goods which have been sold with an agreed right of return within stated terms, shall also have a Return No. The Return No must be obtained before the stated date of return. Returned goods without a Return No, or which have not been packed in original packing, will not be accepted.

14) LIMITATIONS
If any of our suppliers claim limited delivery terms towards us, our terms of delivery will be restricted according to those.

15) SOFTWARE
Sold or borrowed software is not allowed to be copied or spread in other ways, without a written permission.

16) RE-EXPORT
Goods delivered from seller may be subject to special rules of exportation in their supplier's native country. Buyer is responsible to obtain necessary permissions for further export/re-sale.

17) QUESTION IN DISPUTE
To settle any dispute the Karmsund Herredsrett is approved the legal venue.

INSTRUCTIONS FOR THE CONSIGNEE

1) CONTROL
Control the goods immediately by receipt. Examine the quantity towards the invoice/packinglist/shipping documents. Look for outward defects on the packing which may indicate damage on or loss of contents. Control the container and the seals for any defects.

2) SECURING EVIDENCE
When defects on the goods have been found, evidence must be secured, and seller must be informed. Call the transporter and point out the defects. Add a description of the defects on the goods receipt, the forwarder's copy of the way-bill or on the driving slip.

3) RESCUE
Bound the damage. Try to restrict the damage and the loss. Seller will compensate expences incurred due to reasonable security efforts in addition to damage and loss.

4) COMPLAINT
Write immediately a complaint to the transporter or his agent. Forward immediately the complaint to the transporter or his agent, and hold the transporter responsible for the defects. The complaint must be sent at the latest:

- for carriage by sea: within 3 days
- for overland / air transportation within 7 days

5) DOCUMENTATION
For any claims the following documentation is required, and must be forwared to the company or their agent: invoice, way-bill and/or bill of landing, and/or statement of arrival, inspection document, besides a copy of the letter of complaint to the transporter.

Pixel Defect Policy

PIXEL DEFECT POLICY

Dot-defects (Bright or dark spots on the panel)

Due to the effect that dot failures are part of the TFT technology such failure occurrence cannot be prevented basically. Even though dot defects usually occur during production process, new defects can appear within the lifespan of a TFT display. Neither the production at LCD-supplier nor the use of a LCD-Monitor after shipment can be influenced by Hatteland Display. Hence Hatteland Display cannot be made responsible for such dot failures. However Hatteland Display understand and accepts the responsibility towards the customers for the delivery of new displays, therefore accepts a limitation on dot defect's occurrence on new displays delivered to the customer.

PRINCIPLES

a. One pixel consists of 3 dots (Red, Green and Blue)

b. Dot defects are differentiated between:
- Bright dot defects: Spot on the panel appear as pixels or sub pixels that are always lit. Non-extinguishing dot.
- Dark dot defects: Spot on the panel appear as pixels or sub pixels that are always dark (off). Non-lightening dot.

c. Inspector observes the LCD from normal direction at a distance of 50cm above the worktable. Dark dots are counted under entire white screen. Bright dots are counted under entire black screen.

d. Dot failures within tolerances below do not qualify for warranty claims.

PIXEL DEFECT TOLERANCES

Bright dot	≤ 4 dots
Two adjacent bright dots *	≤ 2
Distance between 2 dot defects *	≥ 15mm
Dark dots	≤ 8
Total number of bright or dark dot defects. *	≤ 8

* 1 or 2 adjacent dot defects considered as 1 defect.

EXTRAORDINARY CIRCUMSTANCES

Possible cases which cannot be influenced either by customer or Hatteland Display.

Examples for extraordinary circumstances:
- Allocation from LCD-Supplier
- Outstanding high number of LCD-panels with bright dots but within LCD-suppliers Specification.
- Sharply increased demand by customer

In such cases a mutual agreement is inevitable.

Examples:
- Acceptance of bright dots in "non-critical" display areas.
- Acceptance of bright dots with defined color.

Last Revised July 2007

Notes

General Notes: (For all products)

- The unit is type approved according to EN60945 4th, 4.4, equipment category b) protected from the weather.

- Other type approvals applies for the different products.
  Please see the appropriate “Specifications” page in this manual for more information.

- Use of brillance and Glass Display Control™ (touch key functions) may inhibit visibility of information at night.

Revision History

Rev.	By	Date	Notes
00-1	SE	22 Feb 2012	Release for internal review.
01	AK PM SE	07 Mar 2012	First official release.

Revision History